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| 10/763,178 | 01/26/2004 | Hideo Kidoh | 36856.1209 | 6513 |

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| EXAMINER | |
|---|---|
| DOUGHERTY, THOMAS M | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2834 | |

DATE MAILED: 05/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/763,178 | KIDOH, HIDEO | |
| | Examiner | Art Unit | |
| | Thomas M. Dougherty | 2834 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,4,6,7 and 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6,7 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments with respect to the combination of references has been given careful consideration. In response to the Applicant's argument that there is no suggestion to combine for example Sato, Kadota et al. and Nakamura et al., note that the Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. In re Nomiya, 184 USPQ 607 (CCPA 1975). However there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. In re McLaughlin, 170 USPQ 209 (CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. In re Bozek, 163 USPQ 545 (CCPA)1969. In this case such suggestions are noted in the action below.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 15 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kadota et al. (US 6,946,930). Kadota et al. show (fig. 5A) a surface acoustic wave filter comprising: a piezoelectric substrate (2); an input-side IDT electrode (3a) and an output-side IDT electrode (3b) arranged on the piezoelectric substrate (2) so as to be separated from each other in the propagation direction of a surface acoustic wave; wherein the piezoelectric substrate (11) is a crystal substrate; the input-side IDT electrode (3a) and the output-side IDT electrode (3b) each include an electrode layer made of Al or an Al alloy as a major electrode layer (see col. 5, lines 54-59), and the electrode film thickness ratio $h/\Lambda$ is in the range of from about 0.035 to about 0.06 (see especially the ABSTRACT), wherein h represents the film-thickness of the input-side IDT electrode (3a) and the output-side IDT electrode (3b), and represents the wavelength of the surface acoustic wave; and at least one of the input-side IDT and the output-side IDT electrode is an unidirectional electrode. They don't specifically use the acronym SPUDT. See claim 6 where he lists a variety of options for his device including a unidirectional element.

Kadota et al. don't state that each of the input-side IDT electrode and the output-side IDT electrode has a thickness at which a velocity-dispersion of the filter has a negative value however as Kadota et al. teach the required dimensions this is regarded as inherently being met, unless insufficient structure is described by the applicants to assure their velocity-dispersion requirement.

Claims 1 and 15 are rejected under 35 U.S.C. 103(a) as obvious over Kadota et al. (US 6,946,930) in view of Campbell et al. (US 6,462,698). Given the invention of Kadota et al. as noted above, they don't specifically state 'SPUDT electrode'.

Campbell et al. note in their abstract the advantages of using a SPUDT type IDT in a surface acoustic wave device, including that a "SPUDT-type device reflects SAW components which are lost in conventional IDT designs so that a stronger SAW is directed to ward a transmission element".

Campbell et al. do not note in their abstract a crystal substrate that the input-side IDT electrode and the output-side IDT electrode each include an electrode layer made of Al or an Al alloy as a major electrode layer, and the electrode film thickness ratio $h/\Lambda$ is in the range of from about 0.035 to about 0.06 wherein h represents the film-thickness of the input-side IDT electrode and the output-side IDT electrode, and represents the wavelength of the surface acoustic wave.

It would have been obvious to one having ordinary skill in the art to employ a SPUDT-type electrode in the device of Kadota et al. if in fact it is not, at the time of their invention, for the advantages cited by Campbell et al.

Kadota et al. and Campbell et al. don't state that each of the input-side IDT electrode and the output-side IDT electrode has a thickness at which a velocity-dispersion of the filter has a negative value however as Kadota et al. teach the required dimensions this is regarded as inherently being met, unless insufficient structure is described by the applicants to assure their velocity-dispersion requirement.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. (US 6,946,930) in view of Yoneda et al. (US 6,271,617). Given the invention of Kadota et al. as noted above, they don't note use of at least one electrode layer laminated to the electrode layer made of Al or an Al alloy, the at least one electrode layer being made of a metal excluding Al.

Yoneda notes (col. 5, ll. 37-43) at least one electrode layer laminated to the electrode layer made of Al or an Al alloy, the at least one electrode layer being made of a metal excluding Al in his surface acoustic wave device although he doesn't note the electrode film thickness ratio.

It would have been obvious to one having ordinary skill in the art to employ at least one electrode layer laminated to the electrode layer made of Al or an Al alloy, at least one electrode layer being made of a metal excluding Al such as is shown by Yoneda et al., in the invention of Kadota et al. at the time of their invention in order to avoid the problems or overcome the problems cited in the Description of the Related Art in the Yoneda et al. document.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. (US 6,946,930) and Campbell et al. (US 6,462,698) in view of Yoneda et al. (US

6,271,617). Given the invention of Kadota et al. and Campbell et al. as noted above, they don't note use of at least one electrode layer laminated to the electrode layer made of Al or an Al alloy, the at least one electrode layer being made of a metal excluding Al.

Yoneda notes (col. 5, ll. 37-43) at least one electrode layer laminated to the electrode layer made of Al or an Al alloy, the at least one electrode layer being made of a metal excluding Al in his surface acoustic wave device although he doesn't note the electrode film thickness ratio.

It would have been obvious to one having ordinary skill in the art to employ at least one electrode layer laminated to the electrode layer made of Al or an Al alloy, at least one electrode layer being made of a metal excluding Al such as is shown by Yoneda et al., in the invention of Kadota et al. and Campbell et al. at the time of either of their inventions in order to avoid the problems or overcome the problems cited in the Description of the Related Art in the Yoneda et al. document.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. (US 6,946,930) in view of Oshio (US 2004/0164645). Given the invention of Kadota et al. as noted above he doesn't disclose Euler angles in his invention.

Oshio shows an ST-cut quartz crystal substrate having an Euler's angle (0, Θ, 0), and the angle Θ is in the range represented by $\Theta = (-3\ (h/\Lambda)x100+100+134)+/-1$ .

Oshio doesn't show input and output electrodes that are both IDTs.

It would have been obvious to one having ordinary skill in the art to employ the design of Sato with the Euler angles of Oshio since with such angles "it is possible to

lower the loss accompanied with the propagation ... thereby improving the Q value", as Oshio notes in paragraph 17.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. (US 6,946,930) and Campbell et al. (US6,462,698) in view of Oshio (US 2004/0164645). Given the invention of Kadota et al. and Campbell et al. as noted above they don't disclose Euler angles.

Oshio shows an ST-cut quartz crystal substrate having an Euler's angle (0, Θ, 0), and the angle Θ is in the range represented by Θ = (-3 (h/Λ)x100+100+134)+/-1 .

Oshio doesn't show input and output electrodes that are both IDTs.

It would have been obvious to one having ordinary skill in the art to employ the design of Kadota et al. and Campbell et al. with the Euler angles of Oshio since with such angles "it is possible to lower the loss accompanied with the propagation ... thereby improving the Q value", as Oshio notes in paragraph 17.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. (US 6,946,930) in view of Sato (US 4,340,834). Given the invention of Kadota et al. as noted above they don't disclose a shield electrode.

Sato shows (fig. 1) sa surface acoustic wave filter comprising: a piezoelectric substrate (11); an input-side IDT electrode (12) and an output-side IDT electrode (13) arranged on the piezoelectric substrate (11) so as to be separated from each other in the propagation of a surface acoustic wave.

Sato shows a shield electrode (14) provided between the input-side electrode (12) and the output-side IDT electrode (13).

Sato doesn't note dimensional relationships.

It would have been obvious to one having ordinary skill in the art to employ a shield electrode between input and output IDTs in the device of Kadota et al. at the time of their invention such as is taught by Sato since that design allows for a device that "sufficiently suppresses higher transverse modes in the attenuation characteristics" as noted at col. 2, lines 15-18.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. (US 6,946,930) and Campbell et al. (US6,462,698) in view of Sato (US 4,340,834). Given the invention of Kadota et al. and Campbell et al. as noted above they don't disclose a shield electrode.

Given the invention of Sato as noted above, again, Sato doesn't note dimensional relationships.

It would have been obvious to one having ordinary skill in the art to employ a shield electrode between input and output IDTs in the device of Kadota et al. and Campbell et al. at the time of their invention such as is taught by Sato since that design allows for a device that "sufficiently suppresses higher transverse modes in the attenuation characteristics" as noted at col. 2, lines 15-18.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tsuzuki et al. (US 6,476,691 and US 2002/0125970) show the required film thickness ratio in the first reference at col. 5, line 39. In the second

reference Tsuzuki et al. show the required film thickness ratio, Al electrodes and SPUDT.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd

tmd

May 17, 2006

TOM DOUGHERTY
PRIMARY EXAMINER